

## **ASD Weekly Highlights for the Week Ending 20-Jan-2006**

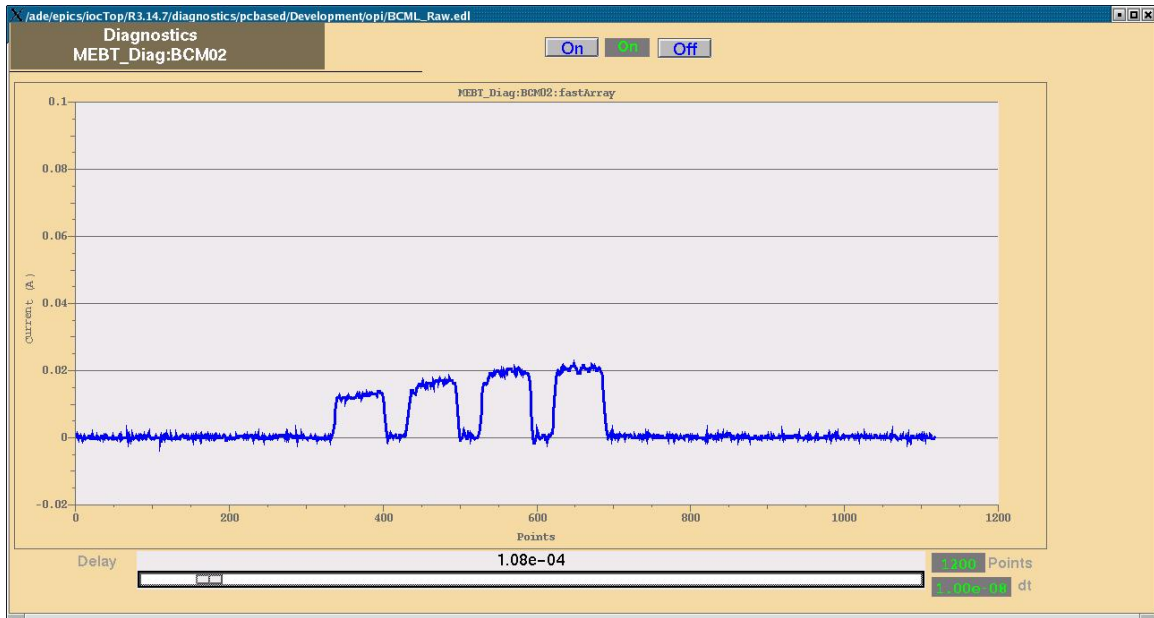
### **Operations**

- Running beam for Commissioning Studies:
  - Running fault studies today.
  - Sparkling grape juice and cups
- Participating with XFD on CD-4 Planning
  - Stuart and Phil Fergusson's plan
- Looking at Database slowdown issue, Logbook and other Database Applications
- SNS-DOE TVA Electric Power Rate Negotiation
- Beginning to look at Barcoded equipment in the Ring
  - Have Magnet data, which were installed where
  - Cannot find anything on Power Supplies
- Working on SNS Work Flow Process
- Integrating Work Flow and Datastream

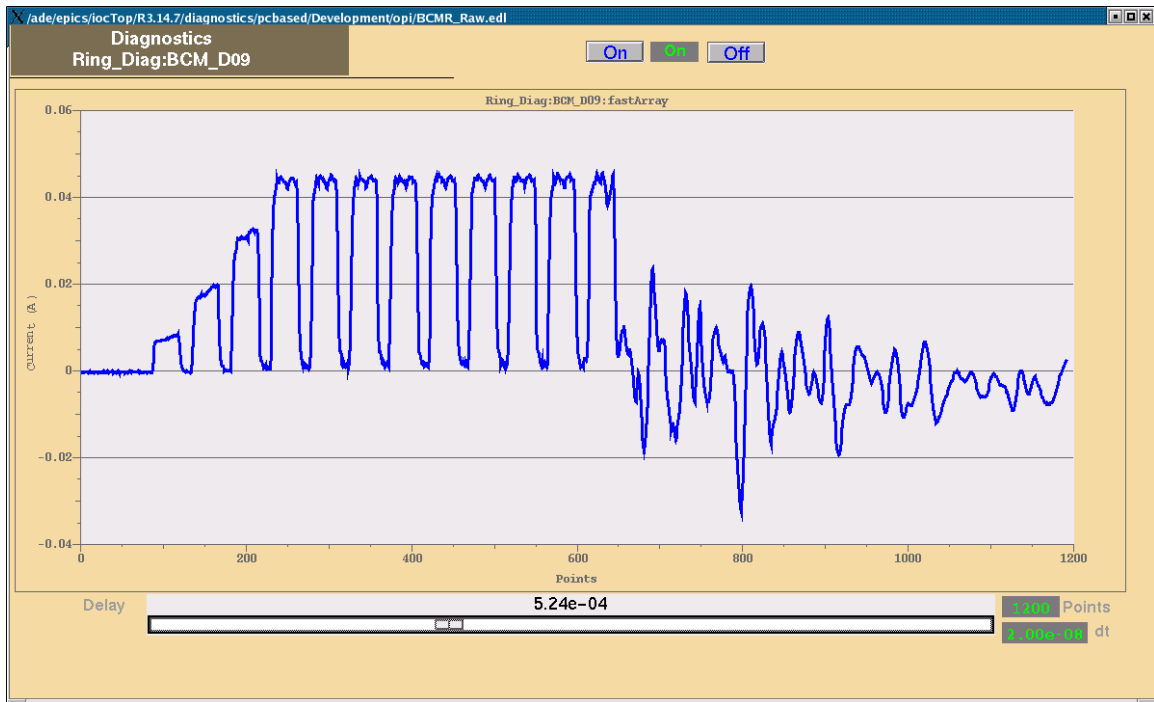
### **Accelerator Physics**

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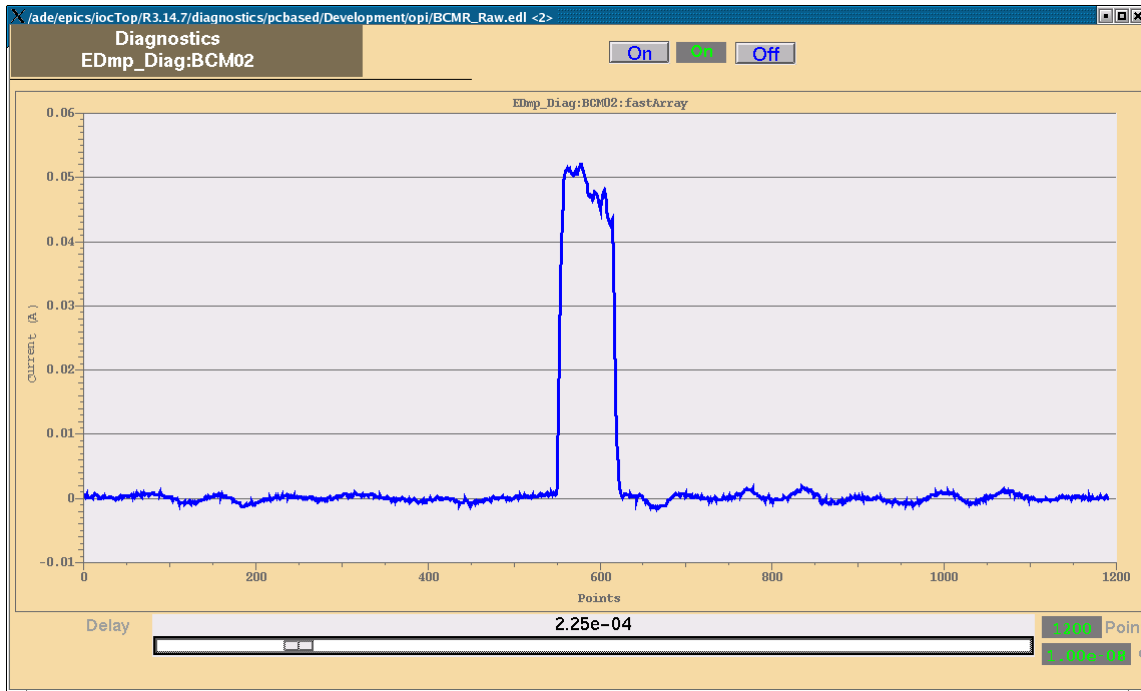
- Ring commissioning began Thursday, Jan. 12. By Monday we had single minipulses delivered cleanly to the extraction dump. We also injected and accumulated up to 7 turns, limited only by the machine parameters in place at the time. Work is now focused on fine-tuning the ring injection and closed orbit. Once that is complete we will increase the beam intensity and start to turn on the pulsed-power systems.



Four minipulses in the linac medium energy beam transport



Injection and accumulation of the 4 minipulses, followed by 8 turns of storage, followed by extraction. The noise at extraction is from the extraction kickers.



The extracted pulse at the extraction beam dump.

## Electrical Systems

- Operational Support – Repaired oil pumps/oil leaks on extraction kicker PFNs, worked with Mechanical group in resolving magnet, magnet bus, and power supply cooling issues, performed LOTOs for work on or near magnets, repaired/replaced power supplies as required. Maintained/serviced LEBT and MEBT choppers.
- Installation – started Harp terminations in RTBT tunnel, rad-hard RTBT power lead and klixon terminations.
- Extraction Kicker Noise Problems – developed preliminary fix for Extraction Kicker Noise Problems. Testing underway.
- Other – oversight of 23 DB electricians for EXP division. I&C checkout assistance to EXP division (target). Design, manufacture and installation of motion control chassis and rf spin precession coils and power supplies for EXP Division (instruments).
- Reviewed 96 research mechanic – electrical resumes in preparation for interviews.

## SRF Facility

### Survey and Alignment

RING:

No activity.

#### RTBT:

Align first rad-quad on mock-up stand (QH28).

Map rad-hard QH28 on mock-up stand.

Drill and prepare new fiducial holes on mock-up stand.

#### TARGET:

BL4: Re-set gauge plate elevation on kinematic mounts in S&A lab.

BL4: Chopper NCS009-3 fiducialized in Mag. Measurement.

BL2: Re-mapped guides prior to removal.

BL11: Substantial as-built of PIP, steel support plates/walls, bolts, and bolt holes.

BL3: Steel support plate as-built survey underway.

BL4: Densify and re-observe gravity oriented network on Newport table in Mag. Measure.

BL4: Re-install gauge plate on stand in Mag. Measure (Re-leveling underway).

#### Miscellaneous:

Remove remainder of tools, instruments, and equipment from the Ring.

Begin re-organization of S&A lab.

Instrument repair and maintenance.

### **Diagnostics**

- Wire Scanners: Three new wire scanners are prepared, tested and vacuum checked for the HEBT. Diagnostics installation team transferred the actuators to the HEBT tunnel yesterday. We will wait for the next maintenance opportunity to install them.
- Commissioning Support: All diagnostics are coming online for the commissioning. The Fast BLMs are tested. They clearly show the individual mini-pulses. During the maintenance day, we modified the electrostatic shielding of the LINAC dump BCM. Low frequency noise and 2 MHz oscillations are eliminated. Extractions dump kickers' noise need to come down by a factor of 1000 to allow clean signal on the Ring BCM for single mini-pulses. BLM system came online from the first pulse. Craig timed in all BPMs. The automated trigger setting for different beam-energy needs improvement. Controls and Diagnostics programmers are working on that

### **Cryo Systems**

### **Mechanical Systems**

**Shielding progress.**

### **Ring Systems Installation Activities**

- The HEBT Charge Exchange Scraper no.7 assembly was started.
- The RTBT EDUMP wire scanner lift device preparation was started.
- The RTBT Target Quad He line installation was started.
- The RTBT HARP mechanism was assembled and tested in the lab.
- The RTBT HARP vessel alignment was completed and removed from the assembly stand.
- The RTBT Target Quad Q28 was placed on the assembly stand for alignment.
- The RTBT Target Quads' strong-back fixtures arrived.
- The RTBT Target quad overhead shielding blocks' welding assembly was started

### **Ring Water Systems Installation**

- The Ring magnet flow control valves were exchanged on six circuits to resolve operational flow issues.
- The Ring magnet hoses were exchanged on two circuits which had previously overheated.
- The RSB magnet cooling skid backup pump was installed and returned to service.
- The RTBT Collimator Cooling Skid was connected to the building headers.

### **RF Systems**

- Supported Ring beam commissioning with very few RF-related problems.
- Performed testing of Thales 402.5 MHz, 2.5 MW klystron in RF Test Facility with Thales representatives in attendance. Further testing is planned with improved accuracy on the measurement of klystron voltage and current.
- Began support of Target Systems completion with full-time assignment of one RF Technician.
- 180 degree phase-flip feature developed via FCM firmware & software modifications to support suppression of dark current with the RFQ.
- Placed order for production of Linac LLRF spares (High-Power Protection Modules and Field Control Module mother boards).
- Alexander Brandt, DESY PhD student, will visit next week to participate in beam loading compensation discussions and experiments.
- Participated in a videoconference on ILC RF and Timing Specifications. The presentations are available at <http://ilc-dms.fnal.gov/Workgroups/Presentations/ILCRFC>

Ring RF

- Working on reducing RF System interference with Ring Diagnostics hardware.

## **Ion Source**

- The source on the test stand has now been operating for 24 days at full duty cycle 24/ 7 except for two nights. After starting with an average pulse current of ~30 mA it has leveled off ~25 mA.
- A source was replaced on the front-end after the output dropped to ~10 mA. The first cesiation failed and produced only ~10 mA. A second cesiation on the next day delivered 35 mA, 29 average.
- Initially it required high gas flow, but that limitation disappeared overnight.
- For more than a week the FrontEnd ion source is running without the 13 MHz starter plasma. This became possible after increasing the H flow to ~25 sccm and the 2 MHz to ~50 kW. This has eliminated the dark current problem as well as noise issues.

## **Controls**

- The Controls Team supported the continuing Ring Commissioning run this week. Small improvements were made during the Maintenance period in response to requests of the operators. Most significant was the addition of the capability to vary the ring rf frequency, and a modification of the LEBT/MEBT Chopper controls to eliminate dark current when the Ion Source beam is off. (Additional features for the LEBT/MEBT Choppers are currently being simulated.) A series of console slow-downs and crashes were a continuing nuisance. Some issues have been addressed and fixed; others are still under study. Installation and testing of the console NE Arc crash buttons was completed this week.
- A small number of MPS faults were repaired, screens were updated and temporary bypasses were added to allow operation in off-normal commissioning modes. Thin Foil signals were added to the MPS Ring and Injection Dump system to prohibit injection into the ring without being in Ring mode.
- The wall current monitor did not function during the first part of the run, and is still being investigated. An alternative strategy for reducing dark current by dephasing the RFQ by 180 degrees was developed but not implemented this week as other mitigations had been effective. This approach may still be needed in the future, and so is only temporarily shelved.
- Twelve people from the Controls Group are now working in the Target I&C systems, as well as three additional technicians who were “volunteered” from

other groups. A list of Target Controls tasks was completed and tasks were assigned. Five procurements were initiated. A Shutter Insert Pressure Indication Panel was designed. Unresolved issues related to the four target cooling loops are slowly being addressed as recently deployed controls group engineers become familiar with these systems. Checkout of the primary shutter controls was started. The proper operation and indication of all installed shutter open and closed limit switches was verified. Operation and wiring of each of the four solenoid valves on the installed shutters was verified by forcing the output to each valve in the PLC logic. A few minor wiring problems were found and corrected. The shutter control logic was verified by monitoring logic commands and simulating PLC control actions with a test manifold. Initial checkout of shutter 3 was started using PLC control. The Target CF archive request file was installed and data is being archived.

- Work continued on the programming and simulation of the TPPS and IPPS systems, as well as on IPPS design and construction. Progress on the increasing herd of chipmunks included three calibrations, two thermal tests and termination of (nearly) all klystron gallery chipmunk cables. In addition, five new chipmunks were received from RIS and two were brought to RICL for calibration.

### **Project Upgrade**

- The SNS Power Upgrade is engaged in final revision of the Conceptual Design Report (CDR) and the Project Funding Profile.
- Recent budget guidance indicates that funding for FY 06 and FY07 will not be as high as previously planned. FY06 will be \$1.5 M with the possibility of additional funds later in the year.
- Internally, SNS PUP is reworking the schedule and funding priorities for \$ 10 M in FY07.
- The net effect of these lower funding levels is for SNS PUP to slip completion one year to FY12.
- The SNS PUP CD-1 Review schedule has firmed up. It will be held at the end of the first week of May 06. (May 3 - 5). This is immediately after the May 06 SNS DOE Semiannual Review.